

Space News

ROUNDDUP!

VOL. 4, NO. 1

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

OCTOBER 28, 1964

November 4-6 At Rice Hotel—

Houston To Host Manned Space Flight Meeting

The Third Manned Space Flight Meeting will hold its opening session at 9 a.m. next Wednesday at the Rice Hotel in Houston and over 1500 people are expected to attend the three day series of meetings.

The meeting will be highlighted by complete status reports on the Gemini and Apollo programs, plus a description of proposed lunar-base locations and functions.

All manned spaceflight projects including lunar bases, space stations, and lunar surface vehicles will be reviewed in depth. The progress thus far as well as future plans will be reviewed.

Registration and a social get-together will be held from 5 to 10 p.m., Tuesday, November 3.

Registration will be held in the foyer of the Rice Hotel and an a la carte social get-together will be held on the hotel's 18th floor. Television will be provided for those wishing to watch election returns.

The meeting, co-sponsored by the American Institute of Aero-

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AIAA/NASA Third Manned Space Flight Meeting Scheduled Program Of Events

TUESDAY, NOVEMBER 3—

5 to 10 p.m. registration and social get-together, Rice Hotel.

WEDNESDAY, NOVEMBER 4—

9 a.m. Grand Ballroom, introduction and welcome by Paul E. Purser, Mayor Louie Welch, and Robert R. Gilruth, followed by Gemini Program: K. S. Kleinknecht, chairman; John M. Fitzpatrick, coordinator.

12:30 p.m., Penthouse, luncheon: Robert R. Gilruth, toastmaster; George E. Mueller, speaker.

2 p.m., Grand Ballroom, Apollo Program: Robert O. Piland, chairman; James Neal, coordinator.

THURSDAY, NOVEMBER 5—

9 a.m., Trinity Room, Launch Vehicles: Capt. Robert F. Freitag, chairman; Jerome B. Hammack, coordinator.

9 a.m., Brazos Room, Guidance and Control: R. C. Langford, chairman; Cline Frasier, coordinator.

9 a.m., Grand Ballroom, Bio-Technologies: R. R. Hessberg, chairman; Ray Carroll, coordinator.

12:30 p.m., Grand Ballroom, luncheon: Col. Dan McKee, toastmaster; Maj. Gen. Marvin C. Demler, speaker.

2 p.m., tour number one of the Manned Spacecraft Center.

2 p.m., Grand Ballroom, Spacecraft Design: George R. Arthur, chairman; Carl B. Peterson, coordinator.

2 p.m., Crystal Room, Simulation and Training: Donald K. Slayton, chairman; John Jones, coordinator.

6:30 p.m., Brazos Room, social hour.

7:30 p.m., Grand Ballroom, banquet: Courtland D. Perkins, toastmaster; Edward C. Welsh, speaker.

FRIDAY, NOVEMBER 6—

8 a.m., tour number two of the Manned Spacecraft Center.

9 a.m., Grand Ballroom, Advanced Manned Missions: E. Z. Gray, chairman; Thomas Briggs, coordinator.

12:30 p.m., Penthouse, luncheon: R. Scott Royce, toastmaster; Harrison A. Storms Jr., speaker.

2 p.m., tour number three of the Manned Spacecraft Center.

2 p.m., Grand Ballroom, Future Challenges: Maxwell W. Hunter, chairman; Donald A. Ahlborn, coordinator.

MSC's Annual Awards Day Scheduled For Next Monday

The Annual Awards Day Ceremony of the Manned Spacecraft Center will be held at 10 a.m., Monday, November 2, in the MSC Auditorium.

Special recognition awards will be presented by Dr. Robert R. Gilruth, director, MSC. These include 30-year service awards, group achievement awards, Presidential citation, and special service awards.

Recognition will be made by

George M. Low, deputy director, MSC, of winners of special awards during the past year, which include non-federal awards, federal awards, 20-year service awards, sustained superior performance awards.

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CHAIRMEN MEET—Paul E. Purser (center), general chairman for the Third Manned Space Flight Meeting, reviews the program with Charles B. Appleman (left), arrangements chairman and George J. Jelniker, technical program chairman. Purser is special assistant to the director of the Manned Spacecraft Center, Appleman is Gulf States District manager for General Electric's Defense Programs Division, and Jelniker is manager of Hughes Aircraft Company's Houston office.

Scientist Astronauts Being Selected For Future Spaceflight Missions

NASA will recruit 10 to 20 scientist-astronauts for the Nation's future manned spaceflight missions it was announced October 19.

The recruiting process began on that date, with a December 31 application deadline. Selection of this first group of scientist-astronauts is to be completed by next spring.

A vast scientific frontier is being opened to direct scientific exploration by man. Observation made by scientist-astronauts will provide new information on the solar system and on man's ability to perform effectively in prolonged spaceflight.

The office of Space Science and Application and the National Academy of Sciences have cooperated in developing the scientific criteria of the selection process and the Academy will conduct the screening for scientific qualifications of the applicants. The Office of Manned Space Flight and the Manned Spacecraft Center will be responsible for all other aspects of selection criteria and screening.

On April 16, 1964, the National Academy of Sciences was requested to participate in establishing scientific criteria for scientist-astronauts by Dr. Homer E. Newell, associate administrator for Space Sciences and Applications, in a letter to Dr. Harry H. Hess, chairman of the Academy Research Council Space Science Board.

Scientific criteria were developed by the Space Science Board Adhoc Committee on Scientific Qualifications of Scientist-Astronauts which began a series of meetings in May.

The scientist-astronaut program is opened to scientists in scientific, medical or engineering specialty or any combination of those specialties. To be eligible for the scientist-astronaut program, an applicant must:

1. Have been born on or after Aug. 1, 1930; be a citizen of the United States; and be no taller than six feet.

2. Have (a) a bachelor's degree (b) a doctorate in the natural sciences, medicine or engineering, or the equivalent in experi-

ence.

3. Have transcripts of academic records sent directly to Scientist-Astronaut, P. O. Box 2201, Houston, Tex. 77058, from all institutions of higher education which he has attended.

4. Have scores in the graduate record examination sent by Educational Texting Service, Princeton, N. J., directly to Scientist-Astronaut at the Houston ad-

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Legal Holiday November 11

Wednesday, Nov. 11, 1964, Veterans' Day, will be observed as a legal holiday.

All offices will be closed and employees will be excused from duty without charge to leave or loss of pay except those involved in functions considered essential for operations.

Employees required to work on the holiday are to be notified as far in advance as possible by supervisors.

MSC Orientation Tour Given Gen. William F. McKee



ENVIRONMENTAL LAB ORIENTATION—An orientation tour of the Manned Spacecraft Center was conducted Oct. 13, for Gen. William F. McKee (ret.), assistant administrator for Management Development, NASA Hq., Washington, D. C. Shown listening to a briefing on the Environmental Laboratories by Aleck Bond (right), manager of System Test and Evaluation, Engineering and Development, are (l. to r.): Dr. Robert R. Gilruth, director of MSC; George Low, deputy director, MSC; and General McKee.

New Astronaut Physician At Cape Is Also Balloon Pilot, Astronomer

A free-balloon pilot, a licensed private pilot, and an amateur astronomer are some of the accomplishments of the new astronaut physician at Cape Kennedy.

Dr. Victor Benson, a captain in the U.S. Navy Medical Corps, was welcomed aboard recently by G. Merritt Preston, manager of Manned Spacecraft Center-Florida Operations. Dr. Benson succeeds former astronaut physician Dr. David P. Morris.

As assistant chief, Launch Site Medical Support Branch, he is charged with the physical well-being of Gemini and Apollo astronauts during prelaunch and post-launch activities at Cape Kennedy.

He is the launch site medical monitor responsible for committing Gemini and Apollo astronauts to flight from a physiological standpoint.

During Project Mercury, Dr.

Benson acted as medical monitor aboard tracking ships located in the Indian, Atlantic, and Pacific Oceans.

Being the astronauts' physician is only one of many facets of Dr. Benson's colorful career. As pioneer in aerospace medical research, he was medical project officer for Project Strato-Lab Five aboard the U.S. Navy training carrier USS Antietam in the Gulf of Mexico.

The project covered research in high altitude physiology. Tests were made on prototype space suits in a near-space environment by sending two space-suited men aloft in a balloon to the outer fringes of the stratosphere. These experiments were a medical stepping stone to astronaut Alan. B. Shepard's suborbital flight in 1961. A highlight of the program was setting a record Navy altitude balloon flight of 113,700 feet.

Stepped-up physiological

medical research for Project Mercury was undertaken by Dr. Benson at the U.S. Navy Acceleration Laboratory in Johnsville, Penn. Appointed resident aviation medical physician, his work in physiological research covered centrifuge acceleration studies to test human response to positive acceleration.

He is also monitored experiments on weightlessness simulated by water immersion. Subjects were immersed in water for as long as 18 hours to test the effects of "g" forces. These simulated weightlessness tests were conducted to insure the physiological success of the nation's first orbital flight made by Astronaut John Glenn.

Before joining MSC-Florida Operations, Dr. Benson was bio-astronautics and staff medical officer at Headquarters, Pacific Missile Range (PMR), Point Mugu, Calif.

However, not all of his time was spent working while assigned at PMR. Instead of taking the usual Sunday drive, Dr. Benson would take his wife Barbara and the children to a free-balloon site where he says, "the entire family would pile into the gondola, light the gas burner to inflate the balloon, and soar skyward to get a bird's-eye view of the countryside."

Born in Soldiers Grove, Wisc. Dr. Benson graduated with honors from the pre-medical school of Luther College, Decorah, Iowa, and obtained his MD degree from Milwaukee's Marquette University, in 1944. He added a masters degree in Public Health from the University of California in 1959.

His Naval career was launched in 1945 at Bainbridge, Md.

Dr. Benson lives in Melbourne Beach, Fla., with his wife, and three children.



ASTRONAUT PHYSICIAN—Dr. Victor Benson, adjusts one of his many diplomas on the wall of his new office in the MSC-Operations and Checkout Building at the Merritt Island Launch Area. Dr. Benson will have complete laboratory facilities for conducting pre-launch and post-launch physiological tests on Gemini and Apollo astronauts.

Dr. George Mueller Appoints William R. Rieke As Deputy

Dr. George E. Mueller, associate administrator for manned space flight programs, NASA headquarters, recently appointed as his deputy William B. Rieke, president of Lockheed Aircraft International, Inc.

Rieke will assume his new duties at NASA headquarters, Washington, D.C., Nov. 2. He succeeds George M. Low, now

deputy director here at the Manned Spacecraft Center.

As deputy associate administrator for manned space flight, Rieke will be principally concerned with institutional and program management pertaining to NASA's manned space flight centers: The Marshall Space Flight Center, Manned Spacecraft Center and the John. F. Kennedy Space Center.

Mueller said NASA was fortunate in obtaining the services of Rieke, "whose background of almost a quarter of a century in management of major aircraft manufacturing and developmental programs ideally suits him for the important manned space flight program position."

MSF Meeting

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navics and Astronauts, and the National Aeronautics and Space Administration, will present a program planned to provide systems-oriented sessions on Gemini, Apollo, man-rated launch vehicles, guidance and control, biotechnology, spacecraft design, and simulation and training. Advanced manned missions and future challenges will be covered the final day of the meeting.

Advanced manned missions session will contain papers on planning and development of lunar bases together with factors influencing the type of base required and possible locations; a survey of problems associated with the design of a two-man lunar surface vehicle with a 175 mile range; and cost analyses of advanced rocket and airbreathing launch systems for space station support that show savings of 80 to 90 per cent over current launch systems.

A briefing and tour of the NASA Manned Spacecraft Center has been scheduled for three times during the meeting. The tour will cover the docking simulator, environmental chambers, simulation laboratories, crew systems work, and new equipment.

The banquet speaker will be Edward C. Welsh, acting chairman and executive secretary, National Aeronautics and Space Council. During the banquet, four AIAA awards will be presented. They are the Astronautics Award for outstanding contribution to the advancement of spaceflight, the Octave Chautau Award for notable contribution made by a pilot to the aerospace sciences, the John Jeffries Award for outstanding contribution to the advancement of astronautics through medical research, and the Robert M. Losey Award recognizing an outstanding contribution to the science of meteorology as applied to aerospace. Award winners have not been announced.

Luncheon speakers are George Mueller, director, Office of Manned Space Flight, NASA; Maj. Gen. Marvin C. Demler, director, Research and Technology Division, AFSC; and Harrison Storms, president, Space and Information Systems Division, NAA.

The program has been organized by General Chairman Paul E. Purser, special assistant to the director, NASA MSC; and Scott Royce, co-chairman, of Northrop Corp., in cooperation with AIAA technical committees.

The Houston section of AIAA will sponsor a coffee extravaganza and fur fashion

Astronauts Pursue Geology Studies In New Mexico

Seven astronauts tackled another chapter in their intensive geology field course last week when they traveled to the Valle Grande of northern New Mexico.

Neil A. Armstrong, Elliot M. See Jr., Edwin A. Aldrin Jr., William A. Anders, Michael Collins, Donn F. Eisele, and C.C. Williams, were slated for a look at the ash flows and caldera area near Los Alamos, N.M.

Dr. Roy Bailey and Dr. Robert Smith of the U.S. Geological Survey, conducted the trip into the area which is a classic example of the ash flow type of vulcanism.

Ted H. Foss and Elbert A. King, of the Lunar Technology Branch, Advanced Spacecraft Technology Division, represented the Manned Spacecraft Center geologists at the two day session.

The trip is being repeated this week, with another group of astronauts attending the outdoor classes. The Valle Grande area contrasts with the basaltic flows which the flight crew studied in Bend, Oregon in early October. Another trip to Bend is tentatively planned for early November.

show for the wives, from 9 to 11 a.m., Thursday, November 5, in the Panorama Room of the Rice Hotel.

Coffee, as prepared in various nations, will be served. Local wives are invited to attend this special function.

Officers of the local AIAA chapter are: C. B. Appleman, chairman; Don Gregory, vice chairman; Mason O'Keiff, treasurer; Robert Williams, secretary; Bev Steadman, chairman of membership; and on the council are Maxime Faget, Homer Dotts, Dr. Clark Goodman, Dr. Allan Chapman, Dr. LeVan Griffis, Morris Newman, R. Scott Royce, and George Bell III.

GT-2 Spacecraft Readied For Launch

The Manned Spacecraft Center-Florida Operations at the Merritt Island Launch Area (MILA) concluded October 18 the installation of pyrotechnics and weight and balance tests at the industrial area on the Gemini Titan GT-2 spacecraft.

The spacecraft was loaded aboard a vertical transport trailer early the morning of October 18, and the white-shroud-covered vehicle carefully moved to Launch Complex 19 where it was electrically mated with the launch vehicle. Except for final prelaunch complex checkouts, the spacecraft was labeled "flight-ready."

Actual physical mating with the Gemini launch vehicle took place last Friday.

Following pyrotechnic installation, the fully instrumented and hypergolically fueled spacecraft was hoisted aloft by a giant crane at the MILA Pyrotechnic Installation Building.

A normal handling sling suspended the spacecraft during the lifting procedure using electronic load cells installed in series with the handling sling. Compression readings were then

taken to determine the gross weight of the spacecraft.

The weighing was performed to verify the actual gross weight of the spacecraft, previously determined by using McDonnell, St. Louis weight figures taken before shipment to MILA, then adding and subtracting items changed during the prelaunch testing at Merritt Island.

Manned Spacecraft Center-Florida Operations systems engineers from the mechanical branch office monitored the weight and balance tests and certified the acceptable weight allowance.

The GT-2 launch is slated for the last quarter of this year, and will be the first and only ballistic flight of the Gemini program. It will preface the two-manned orbital flight scheduled for the first quarter of 1965.



GT-2 MATING—Gemini spacecraft-two for the unmanned ballistic flight is hoisted past the Gemini launch vehicle on Launch Complex 19 at Cape Kennedy.

Gemini Acting Director Duties Assumed By Dr. Mueller

The National Aeronautics and Space Administration announced last week that Dr. George E. Mueller, associate administrator for Manned Space Flight, has assumed the role of acting director of the Gemini Program.

As acting director of the Gemini Program, Mueller has responsibility for direct management of that program as well as his overall responsibility for management and administration of the entire NASA manned space flight program.

George M. Low has been acting director of the Gemini Program since November, 1963. Low, former deputy associate administrator for Manned Space Flight at NASA Headquarters,

has been deputy director of the Manned Spacecraft Center since February, 1964.

William C. Schneider will continue as deputy director of the Gemini program.

Astronauts

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dress above. NOTE: (Examinations will be given Jan. 16, 1965). Completed applications and examination fee must reach Educational Testing Service by Dec. 31, 1964. In the event that an applicant has not taken graduate record examinations and plans to take the January 16 examination, he should note on his application that scores from that examination will be forwarded

to Scientist-Astronaut, Houston, by the Education Testing Service.

5. Submit a Standard Form 57, Federal Employment Applicant Form, available at any U.S. Post Office.

6. Submit a Standard Form 89, Report of Medical History, obtainable at U.S. Post Office. Forms should be signed by both the applicant and his physician.

7. Submit Standard Form 78, Certificate of Medical Examination, Part A to be completed by applicant and Part B, questions one through 21, to be completed by his physician. This form is also available at local post offices or offices of the Civil Service Commission.

All applicants should address their application postmarked no later than midnight Dec. 31,

1964 to Scientist-Astronaut, P. O. Box 2201, Houston, Tex. 77058.

After preliminary screening, certain applicants will be asked to submit additional material including published or unpublished scientific and engineering reports; essays on field experience, research activities, or hobbies related to space mission; and individual thoughts on scientific objectives of manned space missions.

Before final selection of astronauts, applicants will receive a thorough physical examination and will be required to take part in a limited space simulation program. The simulation program will serve to familiarize them with the space environment and determine to a degree their ability to withstand the stresses of launch, spaceflight and reentry.

Selected applicants who are not already qualified pilots will be given individual flight training necessary to qualify them as

pilots of high-performance aircraft and helicopter.

For further information, prospective applicants should write Scientist-Astronauts, P. O. Box 2201, Houston, Tex. 77058.

COST REDUCTION CORNER

MSC Space Program Utilizes Beer Kegs, \$420 Saving Realized

The task requirement called for metal fabrication of two stainless steel liquid pressure vessels of 25-gallon capacity and capable of withstanding a maximum working pressure of 30 psi, plus, two additional vessels of 5-gallon capacity and same pressure were required.

It was estimated that cost of fabrication and procurement of material required would be approximately \$125 each for a total cost of \$500.

The suggestor believed that it might be feasible to use stainless steel beer half-kegs in lieu of fabrication. The problem was checked with a local brewery in Houston, and their half-kegs were found to be suitable.

Four of these kegs were procured at a cost of \$20 each and modified by the addition of welding inlet and outlet screwed fittings on each. They were then hydrostatically tested at 60 psi for a 2-1 safety factor and cleaned for use. At present the beer kegs are satisfactorily being utilized in Building 13 here at the Manned Spacecraft Center.

David B. Mullins Planning and Scheduling Office, Technical Services Division, is credited for this savings of \$420.00.

NASA Senior Management Representatives Briefed Here



MSC BRIEFING—Two days of senior management briefings were conducted here at the Manned Spacecraft Center, October 14-15, for representatives from Marshall Space Flight Center, Kennedy Space Center, and NASA, Hq. Shown above are (center l. to r.) Dr. Wernher von Braun, director, MSFC; and Dr. J. P. Kuettner, deputy director, MSFC Systems Office. They are accompanied by Warren J. North (left), chief, Flight Crew Support Division; and Donald K. Slayton, assistant director for Flight Crew Operations, both at MSC.

Awards Day

(Continued from Page 1)

quality salary increase awards, and suggestion awards.

Invention awards will be presented by Paul E. Purser, special assistant to the director.

Also on the program will be Wesley L. Hjernevik, assistant director for Administration, serving as master of ceremonies, and Stuart H. Clarke, chief, Personnel Division, who will open the program.

An invocation and benediction will be delivered by local ministers.

The MSC awards program is under the direction of the Incentive Awards Committee which is composed of 32 key MSC leaders who review, evaluate and make recommendations to determine the award winners.

Gemini Ejection Escape System



PERFECT FIT — Astronaut Neal Armstrong is shown being X-rayed by Weber engineers to make certain his spinal column fits exactly into his Gemini escape seat.

Among the hundreds of contractors associated with the National Aeronautics and Space Administration's Gemini two-man space program, there is probably only one company that hopes its system will never be used.

The firm, Weber Aircraft Company, of Burbank, Calif., is designing, testing and building the Gemini Personnel Escape System.

This system will operate only if there is a major malfunction during lift-off or re-entry.

Though Weber engineers and technicians hope their system will never be needed, they have designed and tested the escape seat as if it were going to save the lives of each Gemini Astronaut during every mission. "This is the only philosophy you can have when building a system that just might have to save a man's life," says Max Peterson, engineering manager.

neering manager.

Ejection seats have been employed in high speed aircraft since the mid 1940's, but the Gemini program is the first United States manned spacecraft to incorporate this technique.

The Gemini ejection seat escape system must allow an astronaut to sit for long periods of time with minimum fatigue or discomfort. Never before has such a seat been designed. For example, Weber has engineered and manufactured hundreds of ejection systems for high speed aircraft, but none required a pilot to sit in them continuously for days at a time as does Gemini.

This is only one of the engineering challenges that confronted Weber on this project. The ejection system had to be built with a minimum of weight, but in turn be strong enough to withstand the extreme loads of an aborted mission without injuring the crew.

In a pad abort situation, the Gemini Astronauts will be thrust out of the spacecraft and propelled 800 to 1000 feet up and away from an impending Titan II booster detonation and fireball in less than two seconds. This maneuver will generate a maximum force of 24 times gravity (G's) on the escaping pilots before the parachutes open to land each astronaut.

If these extreme "G" forces were sustained, the pressure on a man ejecting from a fighter aircraft would cause serious injury. Weber engineers solved this "G" load problem by design studies that determined the optimum location of the pilot's spine position and center of gravity rela-

tive to seat trajectory during an abort condition. Precise plaster molds of each Gemini astronaut's contour were made allowing engineers to design a comfortable, yet functional seat.

The Gemini ejection system is another milestone in aerospace science for it is the first time an escape mechanism has been so thoroughly individualized for a specific pilot and mission.

With this ejection system, astronauts will also have the capability to eject themselves during launch and after re-entry at altitudes below 75,000 feet. A bail-out procedure permits the astronauts to parachute from the spacecraft, if necessary, leaving the seats in the vehicle.

If called upon, the Gemini escape system will do just about everything necessary to save an astronaut's life except feed him; and, should the occasion arise, it could even do that.

Incorporated in the escape system is a survival kit contain-



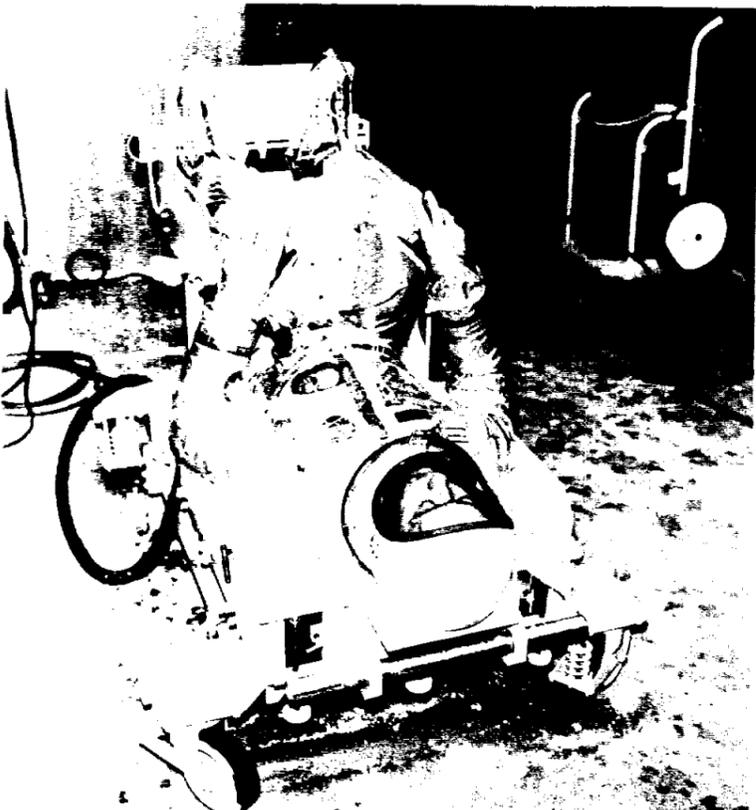
EDWARD L. JAMES
aerospace products manager



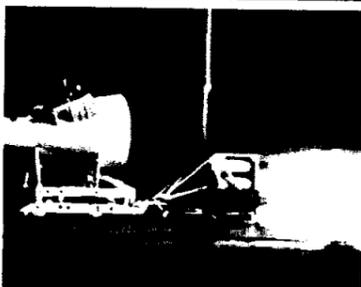
FRED K. GODFREY
president, Weber Aircraft Corp.



CENTER OF GRAVITY—The above fixture developed by Weber Aircraft enables engineers to determine the exact center of gravity of the astronauts and their ejection seats. Astronaut Neal Armstrong is shown during procedure.

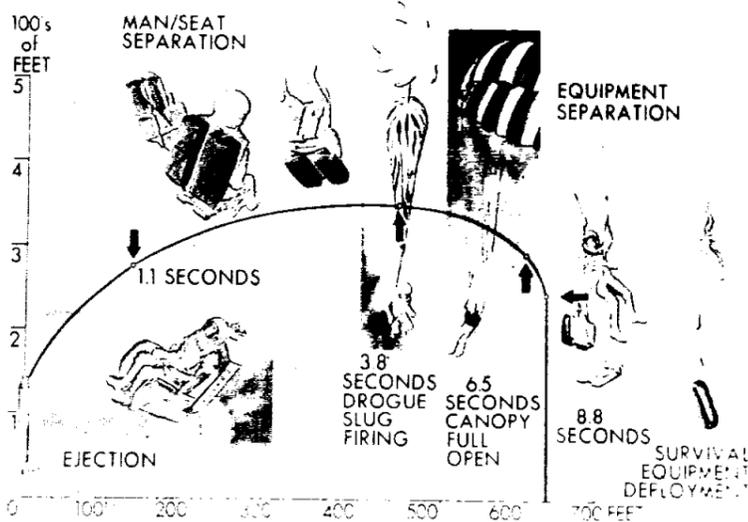


MOLDED-PRECISE PLASTER—Mold of Astronaut John Young's contour is made as he lies in Gemini ejection seat casting fixture at Weber Aircraft.

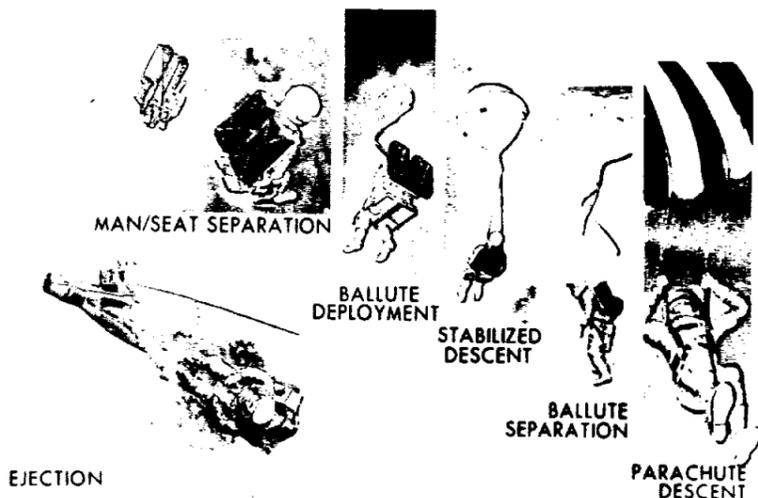


GEMINI EJECTION SEAT TEST — Ejection starts (bottom photo) as sled accelerates to 550 mph. Ejected manikins (center photo) are propelled to altitude by seat rockets. Mortar deployed chute (top photo) lands test specimen.

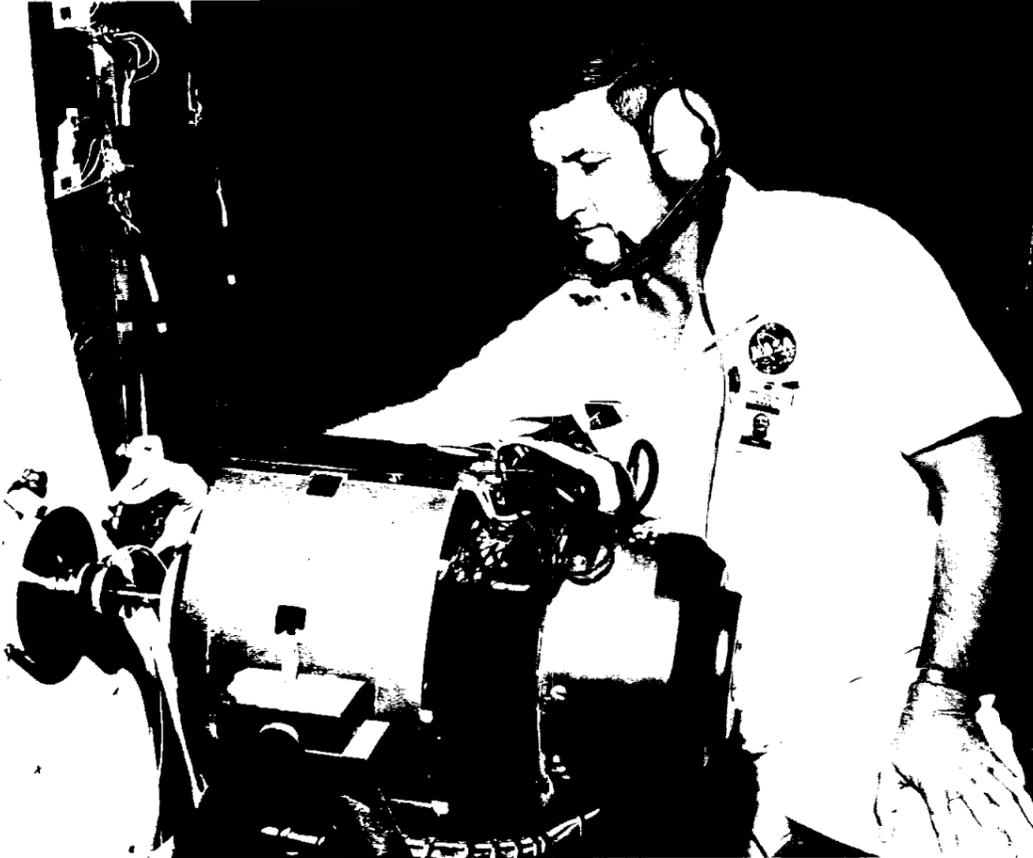
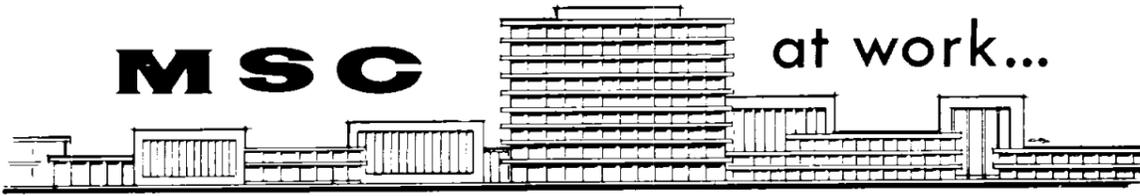
GEMINI OFF-THE-PAD EJECTION



GEMINI HIGH ALTITUDE EJECTION



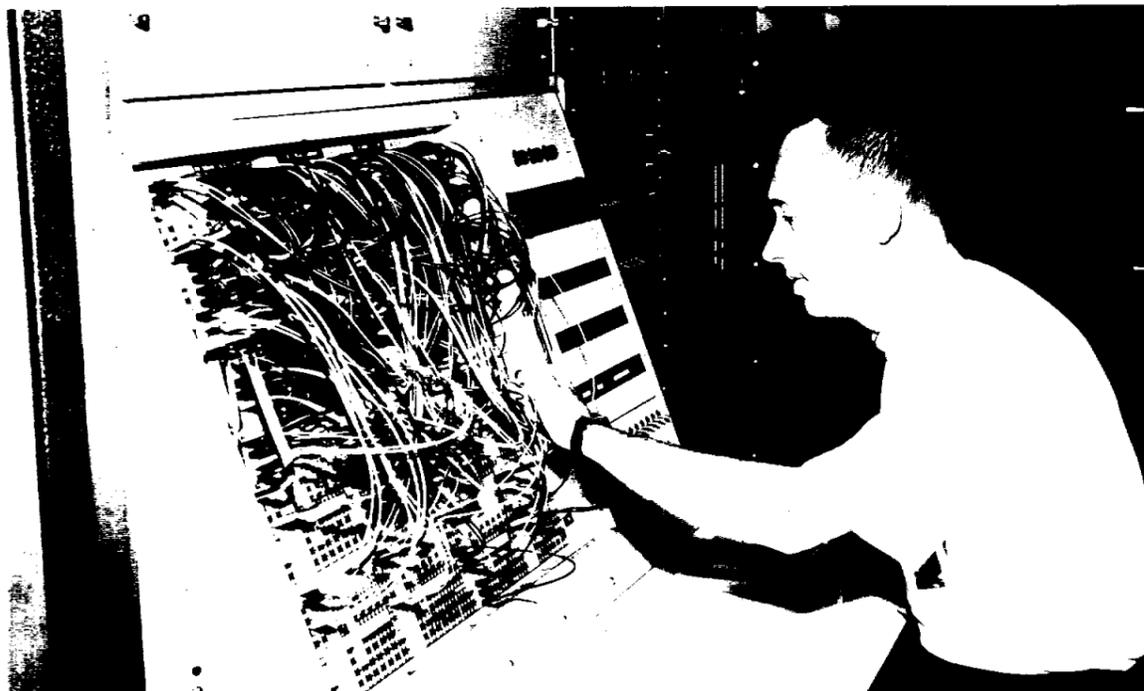
MSC at work...



RONALD RHODES, machinist, Field Test Branch, Technical Services Division, takes vibration readings on Apollo boilerplate-27 service module.



RICHARD A. HOLMAN, electronic development technician, computer, of the Guidance and Control Division, Simulation Branch, makes modifications of servo rate resolvers for a 231R analog computer system.



JAMES R. BOTSFORD, electronic development technician, computer, of the Guidance and Control Division, Simulation Branch, tests for the initial conditions on trice computer.

EAA Third General Assembly Delegates To Be Elected Nov. 3

The Third General Assembly of the MSC Employees Activities Association will be elected by Houston MSC employees on Tuesday, November 3.

Ballots for each employee were distributed by the Mail and Records Branch on October 23, and a list of the nominees in each of the 36 districts will be distributed to each employee this week.

Those elected to the EAA General Assembly will meet later to appoint members of the executive board of the Association.

The election of delegates to the General Assembly will be supervised by an election committee comprised of Tom

Dorough, Colin Kennedy, and Doris Kreske.

Flu Shots Available To Active And Retired Military Dependents

Flu shots for active duty and retired military, and their dependents, are now available at the Ellington Air Force Base Dispensary, it was announced by Capt. Alfred A. Kopecky, USAF, MC, director of Base Medical Services.

The shots are available at the EAFB Dispensary, located in Building 431, between the hours of 7:30 a.m. to 4:15 p.m., Monday through Friday.

Basketball League Organizing

The MSC-EAFB Basketball League is now being reorganized and league play is expected to get underway by the second week in November.

Games will be played in the Ellington AFB gym on Monday, Tuesday and Wednesday nights.

All MSC employees are encouraged to form teams and join the league. Referees are also needed to officiate at the games.

Those interested in entering a team or officiating, may call Perry Sloan at 2431. The deadline in November 3.

MSC Group Schedules Boat Trip, Makes Plans For Holiday Dances

Another trip for MSC employees and their families on the Inspection Boat "Sam Houston," down the Houston Ship Channel, has been scheduled for 2 p.m., Sunday, November 15, by the MSC Social Activities committee.

To insure a reservation on the boat, call Flossie Leggett, Ext. 2438.

Charles Pace has been selected as sub-committee chair-

man for the MSC Christmas dance at Sylvan Beach on December 11.

Future plans include a Mardi Gras dance, and a group trip to Las Vegas, Nev. Watch the Roundup for more about these activities.

If you have a suggestion for Center Social Activities, pass it along to your EAA General Assembly Representative or to Mary Sylvia.

Test Your Security I. Q.

1. NASA employees are permitted to make visits to Communist dominated areas only after obtaining approval of: (a) The NASA Administrator; (b) A Division Chief; (c) MSC Secur-

ity Division.

Master Point Bridge Winners Announced By Club

At the October 6 Master Point game of the MSC Duplicate Bridge Club, first place North-South was taken by Bruce Jackson and Floyd Bennett; second place winners were Clarke Hackler and Richard Baldwin; East-West winners were Gil Conforti and Art Manson, first; and Iris and Jim O'Neill, second.

Winners at the October 13 rating point game were: North-South: Jim and Carol Liput, first; Richard Baldwin and Clarke Hackler, second; East-West: Art Manson and Gil Conforti, first; and Betsy Mason and Leona Kempainen, second.

In the Sectional Tournament in Galveston over the October 17 weekend, Wayne and Elizabeth Brewer were fourth in the non masters pairs and third in the novice pairs.

2. All classified storage containers are required to be posted with names and home telephone numbers of: (a) The secretary responsible for maintaining the files; (b) All persons having knowledge of the combination; (c) Those persons who are to be called in the event a violation is discovered.

3. An MSC employee whose badge indicates "no clearance" is most likely to be in which of the following categories? (a) Derogatory information has been revealed in the personal investigation; (b) The employee is in a position that does not require access to classified information; (c) The employee has not requested a clearance.

4. Which of the following restrictions are applicable to control of personal cameras within MSC? (a) Cameras must be in possession of an MSC employee at all times; (b) Cameras are not to be taken inside buildings (except Bldgs. 1 & 3); (c) Cameras are to be used at the discretion of an MSC employee.

5. The minimum acceptable size of classification marking on a letter-size document is: (a) 1/16" (b) 1/8" (c) 1/4".

(Answers on page 5-A)

Here's What You Can, Can't Do Under The Hatch Act

Many election-year questions are addressed to the Civil Service Commission, which is responsible for Hatch Act enforcement. Some of the questions deal with Federal employees' rights and restrictions under specific provisions of the Hatch Act. Others deal with the Federal Government's attitude toward cooperating with local authorities in an effort to get citizens to register and vote.

The following questions and answers have been prepared for the guidance and information of employees.

Registration, Voting

Q. What is the Commission's general philosophy with regard to the individual's participa-

tion in registration?

A. The Commission, over the years, has expressed the view that it believes all citizens should be encouraged to register and to vote, and that no impediment should be permitted which would hamper an individual from participating in registration activities and voting.

Q. May a Federal employee participate in a registration drive conducted by a political party which is not carried out on behalf of specific candidates?

A. Yes, with certain qualifications. If the Federal employee is engaging in registration activities for the purpose of encouraging the registration of voters on a

partisan political basis, such activity would violate the Hatch Act. The employee must see to it that his role in the drive is wholly nonpartisan in character and that he impartially registers voters for the party of their choice without attempting to influence the individual being registered.

Q. In most states a registrar is appointed by the County Clerk or Clerk of the Court. Can a Federal employee accept such appointment?

A. Yes, if in doing so he gets permission from his agency and the work does not interfere with his agency's business. This is a matter for each agency to decide.

General Restrictions

Specifically, an employee covered by the Hatch Act cannot run for any office as a partisan candidate or campaign for any partisan candidate or engage in any partisan political management. By partisan candidate is meant one representing a National or State political party such as the Democratic or Republican Party. He may not run for office, even as an independent, in an election in which partisan political designations are used, unless he lives in one of the communities to which the Civil Service Commission has given partial exemption.

Q. What employees are prohibited by the Hatch Act from active participation in politics?

A. Employees of the executive branch of the Federal Government and the Government of the District of Columbia, including temporary and part-time employees. The political activity of employees of any State or local agency whose principal employment is in connection with a Federally-financed activity is also restricted.

Q. What is the penalty for violation of the Hatch Act by a Federal employee?

A. The most severe penalty for violation is removal. The minimum penalty is suspension without pay for 90 days.

Q. Please explain for employees affected by the Hatch act what their responsibilities and rights are under the act.

A. They have the right to vote and to express their political opinions, but are forbidden to take an active part in partisan political management or in partisan political campaigns. In connection with Federal employees' right to vote, the Commission emphasizes that political-activity restrictions do not relieve employees of the obligation as citizens to inform themselves of the issues and to register and vote.

Q. May a Federal employee serve in an unofficial capacity at the polls as a checker, challenger, distributor, or watcher, or in any other post in behalf of a partisan political candidate or partisan political party?

A. No. He may not assist such candidate or party in any way.

Q. May a Federal employee use his auto to take voters to the polls on election day, or lend it, or rent it for this use?

A. Generally, no. However, the employee's auto may be used to transport himself and members of his immediate family to the polls. In addition, members of a car pool may stop at the polling place to cast their votes on the way to or from their places of employment.

Q. May employees covered by the Act attend political rallies and join political clubs?

A. Employees covered by the Hatch Act can attend political rallies and join political clubs, but they cannot take an active part in the conduct of the rally or operation of the club. Other things they are prohibited from doing are becoming involved in soliciting or collecting political contributions, distributing campaign material, and selling dinner tickets, or otherwise actively promoting such activities as political dinners.

A. May he make a campaign contribution to his party?

A. Yes, but he cannot be required to do so. The contribution cannot be made in a Federal building or to some other employee who is prohibited by Federal law from accepting contributions. Of course, as a Federal employee, he cannot solicit political contributions.

Q. May a Government employee's wife who is not a Government employee help a friend campaign for political office?

A. Yes. The Act does not restrict the activities of an employee's wife or of other members of his family in any way.

Excused Time Allowed For Voting, Explained By Chief Of Personnel

Standards for excusing employees at the Manned Spacecraft Center for purposes of voting in the November 3 general election were explained by Stuart H. Clarke, chief, Personnel Division.

Employees who desire to

vote in the general election November 3, may be excused for a reasonable time for that purpose if their absence does not seriously interfere with operations.

The polls in Texas open at 7:00 a.m. and close at 7:00 p.m.

Employees may be granted excused leave at the end of the work-day beginning at 4:00 p.m. or at the beginning of the workday until 10:00 a.m. If the employee's regular tour of duty begins after 10:00 a.m. or ends prior to 4:00 p.m., excused leaves should not be granted.

Employees who must vote absentee may do so by presenting their poll tax receipt to the County Clerk's office anytime during the period October 14 through October 30.

If an employee's voting place is beyond normal commuting distance and vote by absentee ballot is not permitted, the employee may be granted excused leave up to one day to make the trip to the voting place. Time off in excess of one day will be charged to annual leave or, if annual leave is exhausted, to leave without pay.

Alley Oops	16	12
Whirlwinds	16	12
Roadrunners	14	14
Pseudonauts	13	15
Technics	13	15
Green Giants	12	16
Turkeys	11	17
Spastics	10	18

High Game: Hecht 244, Blacklock 225, Rowell 222.

High Series: Keggins 607, Folwell 604, Brenton 519.

High Team Game: Fabricators 990, Alley Oops 919, Whirlwinds 911.

High Team Series: Fabricators 2641, Sizzlers 2542, Turkeys 2381.

MSC BOWLING ROUNDUP

MSC MIXED LEAGUE
Standings as of Oct. 19

TEAM	WON	LOST
Alley Cats	19	5
Eight Balls	19	5
Celestials	16	8
Dusters	16	8
Gutter Nuts	14	10
Shakers	12	12
Virginians	11	13
Chugg-a-Lugs	11	13
Hawks	8	16
Play Mates	8	16
Falcons	7	17
Goof Balls	5	19

High Game Women: Barnes 180, Taylor 174, Gassett 165.
High Game Men: Morris 230, Schmidt 221, Petersen 216.
High Series Women: Barnes 511, Gassett 450, Andricks 387.
High Series Men: Spivey 574, Morris 570, Petersen 557.
High Team Game: Dusters 803, Celestials, Virginians 796, Chugg-a-Lugs 787.
High Team Series: Alley

Cats 2227, Virginians 2225, Celestials 2222.

MSC COUPLES LEAGUE

Standings as of Oct. 20

TEAM	WON	LOST
Who Hoppen:	23	5
Hi-Ho's	20	8
Crickets	17	11
Schplitz	16	12
Sandbaggers	15	13
Goofballs	12	16
Alley Cats	12	16
BLTZF	12	16
Pinsplitters	11	17
EZ-Go	10 1/2	17 1/2
Thinkers	10	18
Bowlernauts	9 1/2	18 1/2

High Game Women: S. Swain 234, D. Donatto 223.

High Game Men: D. Kennedy 225, J. Warren 219.

High Series Women: S. Swain 548, 526, 524, J. Foster 514.

High Series Men: G. Sandars 568, D. Behne, J. Warren 561.

MIMOSA MEN'S LEAGUE

Standings as of Oct. 15

TEAM	WON	LOST
Fabricators	18	10
Sizzlers	17	11

CQ—Calling All MSC Hams, Organizational Meeting Date Set

The first meeting of the amateur radio operators at MSC will be held at 5 p.m., Friday, November 6 in room 1025 (the auditorium) of Building 30.

All licensed radio amateurs and those interested in obtaining

a license are invited.

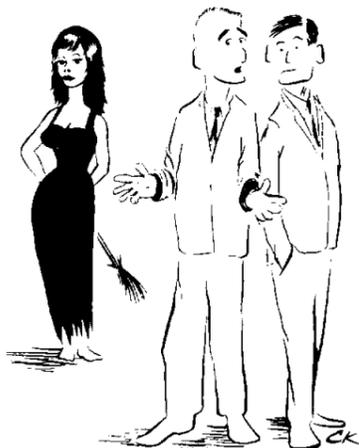
A brief meeting is called to organize and to set objectives. Discussion will be the theme and all opinions are welcomed.

Those interested who are unable to attend, and those who have questions which cannot be deferred until the meeting, are asked to contact Lee Ruetz at extension 5501.

ANSWERS

TO SECURITY QUIZ

1. A, 2. B, 3. B, 4. B, 5. C.



"She says she would rather go 'trick or treating' than to the MSC Christmas party."



FEDERAL SERVICE AWARD—White Sands Operations employee Rudy Gerdin, left, is recognized for 15 years of Federal service. Gerdin, chief of the Design Branch, accepts the certificate of service from his supervisor, Facilities Office Chief Gerald F. Ard. Gerdin has been with White Sands Operations since September, 1962.

Built By Weber Aircraft

ing food, water, life raft, fishing gear, a radio transmitter and a machete, all of which are pre-packed into the seat.

Upon receiving the contract from McDonnell Aircraft Corporation in April 1962, Weber organized a complete Gemini management team capable of directing and controlling all aspects of the program including scheduling, reliability and rigid cost control.

Initial systems testing was conducted at the U. S. Naval Ordnance Test Center, China Lake, Calif., using a 150-foot-high tower. During these tower tests, every possible escape condition was simulated by firing each seat at different attitudes to determine how the system would perform under adverse conditions.

Working simultaneously with the field testing operation, Weber engineers and scientists in Burbank were busy conducting environmental studies on the system's related components, including harnesses, back pack, straps and pyrotechnics. Utilizing Weber's modern environmental labs, engineers determined component reaction under extreme heat, cold, humidity, shock and the spatial atmosphere inside the Gemini spacecraft. These, and other series of studies, provided engineers with the necessary data to select the proper materials and an operational design configuration.

High speed track tests are currently being conducted with a full-scale Gemini boilerplate spacecraft mounted on a rocket-powered sled. The sled is accelerated to 550 mph when the escape system is actuated, causing the seats to be ejected out and away from the speeding vehicle. These critical tests qualify the system for high speed ejection capability.

High altitude tests are also conducted at the Naval Parachute Facility, El Centro, Calif.,

utilizing an F-106 supersonic fighter flying at mach 1.75 and 20,000 feet. More than 100 studies and tests will have been conducted in the laboratory and field before the system is mandated as operational Gemini equipment.

The side-by-side ejection seats inside the Gemini spacecraft will function as one complete system. Should the need to abort arise, the decision to eject is made by the astronauts themselves. Once it is determined to eject, either pilot can pull the escape ring located between his knees ejecting both astronauts.

When the system has been actuated, the remainder of the operation is fully automatic. First, both hatches of the Gemini spacecraft are opened simultaneously, then the rocket powered escape seats are propelled out of the vehicle.

Then, 1.1 seconds after ejection the seats and men separate; 2.7 seconds later a high powered gun or mortar fires, extracting a pilot chute from the astronaut's back pack much like a cannon fires an artillery shell. The deployed pilot chute then pulls a 28 foot diameter main parachute out allowing for full canopy inflation.

Just 8.8 seconds after leaving the Gemini spacecraft, both astronauts will descend to a safe landing.

After re-entry the astronauts will have the option of riding the spacecraft to water impact beneath a Northrop-Ventura 84 foot Ringsail parachute or ejecting themselves and landing much like a paratrooper.

In most instances the latter method will not be used unless the spacecraft enters the earth's atmosphere at a point where a dry landing must be performed.

If the returning astronauts use their alternate landing system, the ejection sequence will function as in a pad abort situation with one exception. At altitudes

above 9,000 feet a new device in parachuting called a Ballute will be employed. Designed and built by Goodyear, the Ballute will stabilize and decelerate the ejected astronauts to a speed well within human tolerance.

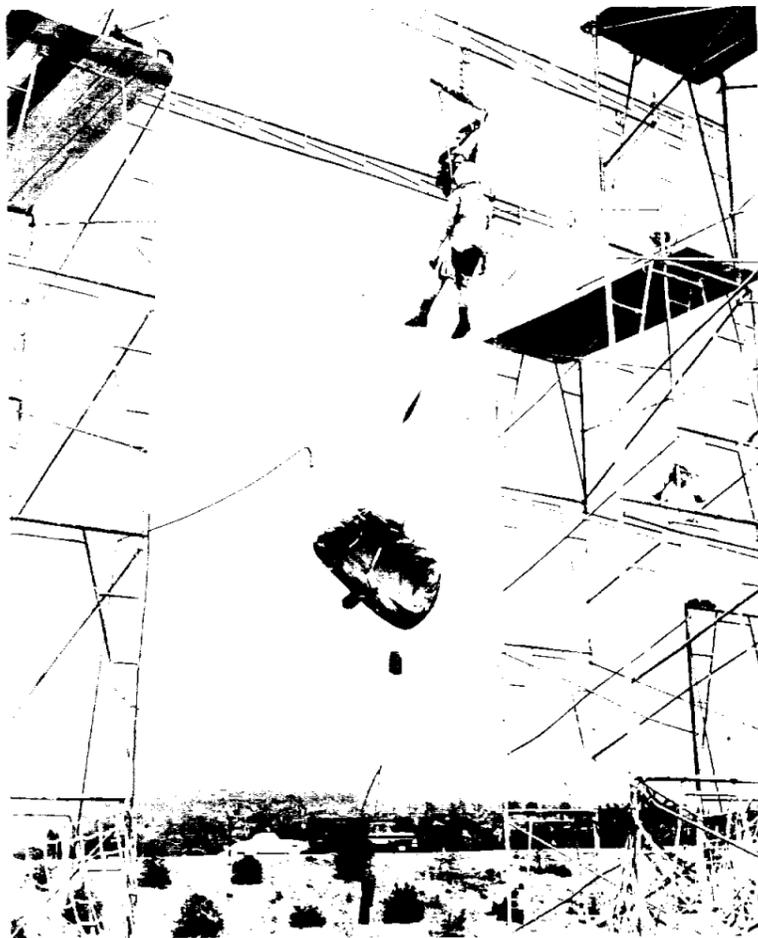
Attached to their back packs by a long lanyard the balloon-like inflatable bag is constructed of a heat resistant material capable of being deployed at altitudes up to 75,000 feet above the earth. At approximately 9,000 feet the Ballute lanyards are cut, and the main personnel chutes are mortar deployed permitting each astronaut to land at the same velocity experienced by sky divers.

With Weber Aircraft Company's vast experience in program management and product development, NASA's Manned Spacecraft Center selected the firm to design and test a new type of astronaut couch for possible application to future missions. When developed, the impact attenuator couches will be 50 per cent lighter and take up less room than the ones presently being used.

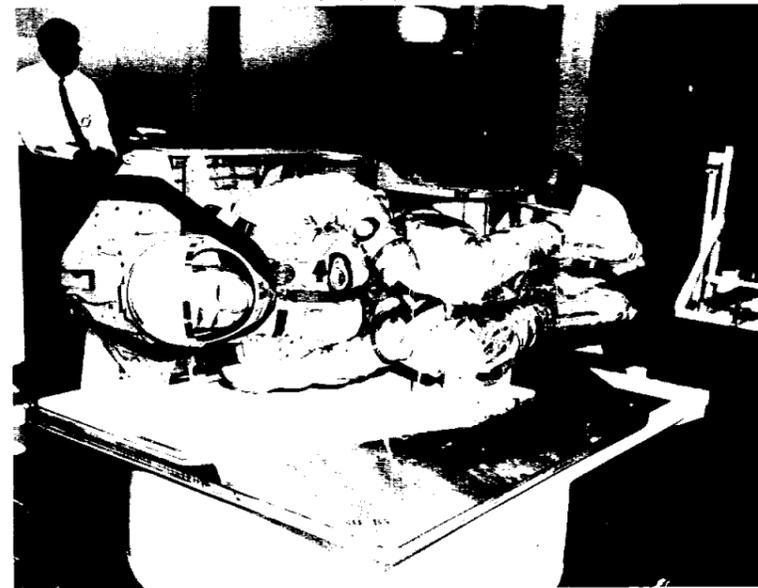
Weber Aircraft has been in operation for more than two decades, now employing 800 people, including field office representatives in Houston, Tex., Dayton, Ohio and Washington D. C.



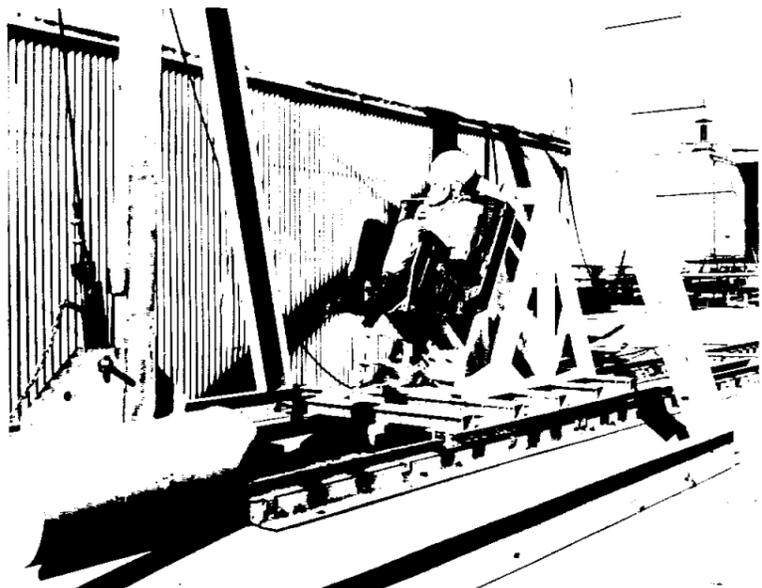
MAX A. PETERSON
project manager
Gemini escape system



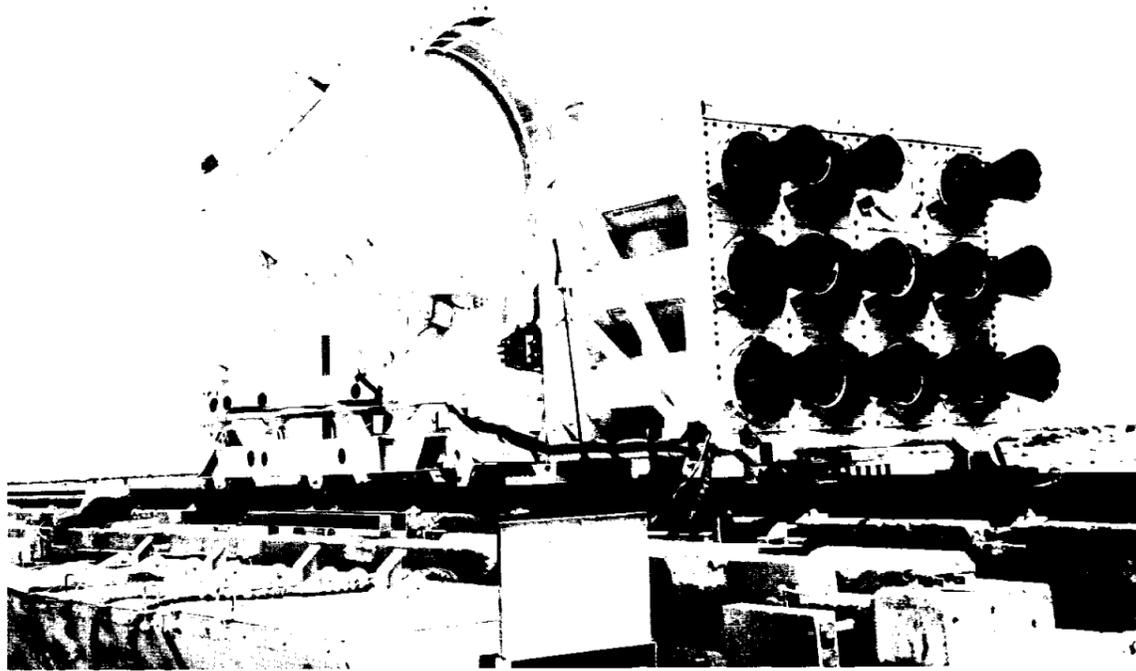
SURVIVAL KIT—The Gemini Escape System incorporates into each seat, a survival kit that contains food, water, fishing line, a radio transmitter, a life raft and other rescue gear. Deployment of the equipment is tested by Weber technicians at the company's plant.



DYNAMIC TESTER—Located at Weber Aircraft Company, Burbank, Calif. facility, this unique device will simulate astronaut "G" loads prior to field testing.



DEVELOPED BY WEBER AIRCRAFT—This special Moment of Inertia fixture enables engineers and scientists to pinpoint each astronaut's exact Moment of Inertia during an escape condition. NASA Astronaut Edward White is shown here being tested.



HIGH SPEED SLED TEST—This rocket powered sled with a Gemini boilerplate vehicle mounted on it, will be accelerated to 550 mph to test the spacecraft escape system at high speed.

EDITOR'S NOTE: This is the thirty-fourth in a series of articles designed to acquaint MSC personnel with the Center's industrial family, the contractors who make MSC spacecraft, their launch vehicles and associated equipment. The material on these two pages was furnished by the Public Relations Department, Weber Aircraft Corporation.

The SPACE NEWS ROUNDUP, an official publication of the Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas, is published for MSC personnel by the Public Affairs Office.

Director Robert R. Gilruth
 Public Affairs Officer Paul Haney
 Chief, News Services Branch Ben Gillespie
 Editor Milton E. Reim

SPACE QUOTES

Dr. Edward C. Welsh, Executive Secretary, National Aeronautics and Space Council, addressing Philadelphia Chamber of Commerce, Sept. 18, 1964.

" . . . A misconception about our space program flows from those whose reasoning is handicapped by what might be called the 'either/or' philosophy. In the simplest terms, this concept is that we can have either a space program or a slum elimination program, but not both; that we can have either a space program or a program to care for the elderly and the ill, but not both.

" . . . No realist believes that this country cannot afford to invest in our national security and in technological progress just because we are not investing enough in some other phases of our economy. Actually, investments stimulate other investments; they do not deter them. This is not an either/or proposition, i.e. schools or space. Rather, the one helps the other. Both are needed and both can be afforded. What is more, decreased spending in education, for example, does not automatically increase the funds available for space exploration, or vice versa. We cannot afford to neglect any of the basic essentials, including space exploration, if we are to continue to be the world's leading peace-loving and freedom-loving nation."

Stewart, Sandra R. Thompson, Deanna J. Vail, and Betty J. Welch.

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PROPULSION AND POWER DIVISION: Richard J. Boyer, and Sally J. Seward.

STRUCTURES AND MECHANICS DIVISION: Gloria K. Haywood, and John M. Trebes.

ADVANCED SPACECRAFT TECHNOLOGY DIVISION: Richard W. High, and Rudolph Trabanino.

ASSISTANT DIRECTOR FOR FLIGHT OPERA-

who served as first Administrator of NASA; and to Dr. Hugh L. Dryden, who has been Deputy Administrator of NASA since its establishment and who before that was Director of the National Advisory Committee for Aeronautics. Having worked with both of these gifted and dedicated men, I feel privileged to join you today in a tribute to them and to their unselfish contributions.

"I would also pay tribute to the thousands of others in NASA's program who work tirelessly at their jobs. They are demonstrating to this nation and to the world that the American spirit is indomitable."

To these words, James E. Webb, administrator of NASA said, "I wish to add my own personal thanks and congratulations to all of you for devoting yourselves so tirelessly to turning into reality mankind's age-old dream of 'sailing in this new ocean' of space."

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On The Lighter Side



President Sends Message On NASA's 6th Anniversary

The President sent the following message to NASA on the occasion of the Sixth Anniversary, October 1:

"The tremendous successes of our national programs in aeronautics and in space over the past twelve months are a source of pride for all Americans.

"We must be first in space and in aeronautics to maintain first place on earth. The accomplishments of this past year show clearly that we are making rapid progress to achieve and maintain that position.

"Significant as our success has been, it is but indicative of the far greater advances that mankind can expect from our aeronautical and space efforts in coming years. We have reached a new threshold of competence in the air and beyond it in space which opens to us the widest possibilities for the future.

"It is fitting on NASA's Sixth Anniversary that honor is being paid to Dr. T. Keith Glennan,

Welcome Aboard

During the last reporting period, a total of 91 persons joined the Manned Spacecraft Center. Of these, four were assigned to White Sands Operations, 18 to MSC-Florida Operations, and the remaining 69 here in Houston.

PUBLIC AFFAIRS OFFICE: Marilyn L. Hartman, Patricia J. Kreske, and Janet M. Mills.

ASSISTANT DIRECTOR FOR ADMINISTRATION: Joseph T. Dickerson.

OFFICE OF ADMINISTRATIVE SERVICES: Harold E. Carter, Cora F. Prine, and Phyllis M. Thomas.

OFFICE SERVICES DIVI-

MSC PERSONALITY

Apollo Acceptance Testing Directed By J. C. Moser

The 18-year government career of Jacob C. Moser has ranged from aircraft instrumentation and testing at Lewis Research Center, Cleveland, Ohio to direction of acceptance test activities for Apollo manned spacecraft at Merritt Island, Fla.

Moser, assistant manager for Apollo at MSC-Florida Operations, is responsible for planning, organizing, and directing all spacecraft acceptance test operations in the Apollo program.

Late in 1946, Moser joined the National Advisory Committee for Aeronautics, since redesignated the National Aeronautics and Space Administration, and after graduation from Fenn College at Cleveland, Ohio in 1949, he was assigned as an electronic engineer in the Flight Research Branch, Lewis Research Center, at Cleveland.

While at Lewis, he was assigned to the "Crash Fire" program and became responsible for the electrical control and instrumentation of aircraft used in this program. The program was an early research effort in which aircraft were deliberately crashed to determine causes of fires in aircraft accidents.

One flight research project to which Moser was assigned while at Lewis was the instrumentation, acquisition, and processing of data used in the hydrogen fuel flight tests conducted on a B-57 aircraft.

While at Lewis in 1958, Moser was assigned to the Space Task Group and was responsible for instrumentation of the first "Big Joe" vehicle launched. Later he was assigned the responsibility for the instrumentation of Mercury Spacecraft and their astronaut pilots.

In 1962 Moser was appointed assistant chief for Data Systems

TIONS: Phyllis J. Halstead, and Elouise F. Peyton.

FLIGHT CONTROL DIVISION: Harold Black, Oscar M. Holley, William D. Maxhaum, and Eddie A. Tarkington.

GEMINI PROGRAM OFFICE: Marvin G. Bohanan, Wallace W. Groda, Sherry L. Herman (St. Louis, Mo.), Thomas E. Herrington, Vernon H. Kerner (St. Louis, Mo.), and Nancy L. Washburn.

MSC-FLORIDA OPERATIONS (Merritt Island, Fla.): Ruth E. Dillingham, Joseph M. Dunn, Evelyn B. Fenster, George A. Fielder, Rosanne M. Griffo, James Henderson, Carole A. Hoff, Bonnie Lee Holum, Phyllis A. Hughes, George E. Kelly, Ronald A. Page, Hilda A. Patterson, Grace Hider Petty, Jane B. Richards, Edna M. Rogers, Ernest N. Sizemore, Alice Ruth Smith, and Curtis D. Warnick.

APOLLO SPACECRAFT PROGRAM OFFICE: James W. Devoll, and Virginia A. Trotter.

WHITE SANDS OPERATIONS (Las Cruces, N. M.): Gloria E. Dye, Beatrice L. Murillo, Martin L. Raines, and Elizabeth J. Richard.

for MSC-Florida Operations. His responsibilities during the Mercury program included pre-flight operational testing of ground and airborne telemetry, communications, and radar in Mercury spacecraft. He was also



JACOB C. MOSER

responsible for the evaluation of instrumentation systems during preflight, flight and post-flight phases of the mission. This included tests before and after installation in the Mercury spacecraft and the development of Mercury ground checkout facilities.

As manned spacecraft programs have progressed, so also have the data systems used to acquire information on each flight. The ground checkout equipment was the fore-runner of ACE-S/C. (Acceptance Checkout Equipment for Spacecraft).

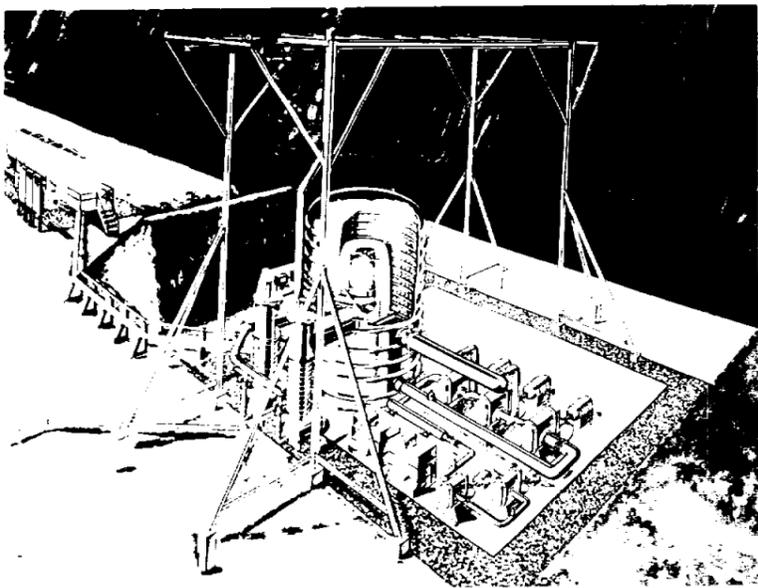
Moser's organization was responsible for the development of this automatic digital spacecraft checkout system.

Moser recalls the humble beginnings of his organization when he and about 10 instrumentation specialists arrived in 1960 at what was then Cape Canaveral. They set up shop in a small corner of Hangar S, where the last Vanguard launch vehicle was being readied for flight.

Since joining NASA, Moser considers his outstanding achievement to be "helping to organize teams to launch men in the Mercury program." Moser said, "I will never cease to be amazed at the willingness of people to work hard, even when there is no personal reward connected with a project."

Moser enjoys reading and includes among his favorite authors Hudson, Kant, Snow, Dostoevski, and Mencken. He indicated that he has had to give up handball, baseball, and football, his favorite participation sports, but has recently taken up surf fishing.

Moser and his wife Joanne live in Indialantic, Fla. They have one son, Forrest, age 21, who is presently attending Stetson University at Deland, Fla.



SUPER COLD CHAMBER—A cutaway drawing of the vacuum chamber to be installed at the Santa Cruz, Calif., Test Base of Lockheed Missiles & Space Co. is shown above. Inside is a test fuel tank of a cryogenic space vehicle which will be filled with liquid hydrogen maintained at 423 degrees Fahrenheit below zero. To be tested next summer are various insulations to keep the liquid hydrogen rocket fuel in its super-cold (cryogenic) state for long periods and under vacuum conditions such as exist in outer space.

Super-Cold Propellant Testing To Be Under Space Conditions

Lockheed Missiles & Space Co., Sunnyvale, Calif., announced recently that it has begun construction of a seven-foot-diameter fuel tank to keep liquid hydrogen at 423 degrees below zero.

The test tank and its support structure are the hardware portion of a \$542,000 study contract awarded Lockheed by the NASA Lewis Research Center.

Titan II Power Is Equal To 22,000 Autos

If you could harness the power of 22,000 average American automobiles, you'd have just about enough horsepower to launch two American astronauts into space in the Gemini spacecraft.

That's about what it will take NASA scientists say—about six and one-half million horsepower to launch the mighty Titan II rocket which will place the Gemini in orbit.

The combined horsepower of 22,000 U.S. cars is about equal to the velocity that the Titan will develop in launching Gemini.

A monumental refrigeration problem faces scientists planning future spacecraft. Large spacecraft designed for long missions will need a more efficient propellant than those now generally used. Liquid hydrogen is that fuel, according to many government and industry scientists.

But liquid hydrogen, to remain in its liquid state, must be maintained at minus 423 degrees Fahrenheit, and proposed missions may last anywhere from eight to 90 days in the vacuum of space.

How can a fuel tank of liquid hydrogen be kept this cold for that long? In the language of the scientist, the objective of the program is "to develop the technology necessary to design a thermal protection system for cryogenic spacecraft modules."

The study will extend to late 1965, and will involve the construction of test fuel tanks and the use of various types of insulation.

Lunar Flying Vehicle And Mobile Lab For Moon Explorers, Subject Of Studies

A rocket-powered vehicle which would enable astronauts to launch themselves from the moon's surface in an emergency and rendezvous with a lunar orbiting craft is one of several lunar transportation devices being investigated by Textron's Bell Aerosystems Company for the National Aeronautics and Space Administration.

Bell has been awarded a contract to provide NASA's Langley Research Center, Hampton, Va., with parametric data on the performance of several types of transportation devices to be used in the vicinity of the moon. This information will be used at Langley for simulation of these various devices in preparation for future space programs.

The variety of vehicles being investigated ranges from a back-mounted device for a single astronaut to a one or two-man platform type configuration. Emphasis will be placed on simple, minimum weight systems.

In addition to establishing performance characteristics for the vehicles, Bell is also providing conceptual designs for each system.

"For short range missions it appears that a back-mounted device, similar to Bell's Rocket Belt, will be satisfactory," explained technical director Dr. Leonard M. Seal. "For surface translation missions greater than approximately 20 miles, a vehicle on which an astronaut is positioned is required." He added, "The purpose of the vehicle naturally will determine its configuration."

Seal, who is chief of Bell's space systems advanced design section, pointed out that with a rocket-type system an astronaut would be able to fly up the side of a lunar crater or over surface crevasses and explore otherwise inaccessible terrain. In an emergency, the device would be able to carry the astronaut to a lunar orbiting space vehicle, such as the Apollo spacecraft.

Bell recently announced re-

ceipt of another NASA contract to conduct preliminary design studies of rocket propelled two-man Lunar Flying Vehicle (LFV) for lunar rescue and reconnaissance missions.

The LFV would be employed in conjunction with a Mobile Laboratory (MOLAB).

The MOLAB concept is being studied by NASA to support a possible 14-day manned lunar exploration mission following project Apollo. The LFV will be designed to enable rapid transit of the astronauts to safety from any lunar danger encountered or from a malfunctioning MOLAB. It also may be used to explore terrain inaccessible to the MOLAB or carry an astronaut on reconnaissance, surveying, photography or mapping missions.

In this concept of the LFV a rocket engine is located between the astronauts. This throttleable propulsion system will enable the LFV to hover, or fly a flight path much like a helicopter. In addition to a single engine vehicle, Bell is providing NASA with preliminary designs of multiple engine configurations.

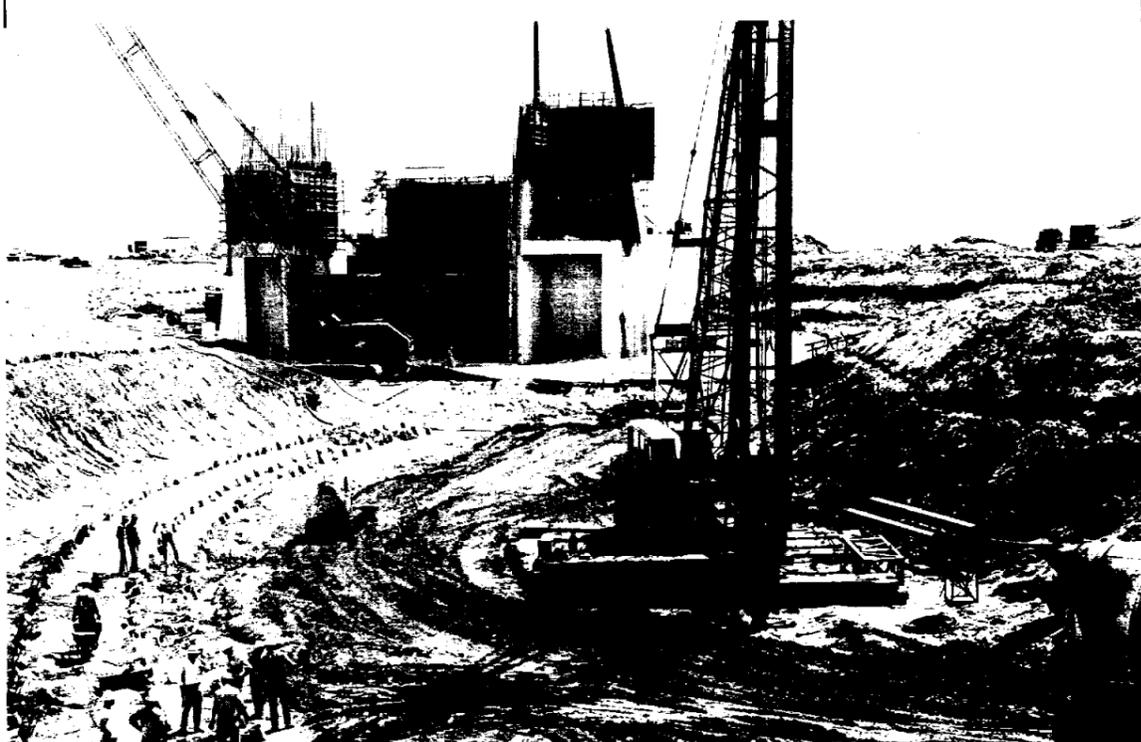
Reaction control rockets, at the corners of the vehicle above the landing struts, will help maintain the craft's stability in flight. They are powered by the same propellants as the main engine.

Positive expulsion fuel tanks are located beneath the astronauts control consoles and behind the vehicle. Life support and communication equipment is carried on the backs of the astronauts.



MOON EXPLORATION CAR—This is a full size model of a mobile laboratory (MOLAB) configuration being studied by NASA's Marshall Space Flight Center to support roving lunar explorers for up to two weeks. MOLAB would replace the ascent stage of the Apollo Lunar Excursion Module and be placed on the moon by a Saturn V launch vehicle. A second Saturn V launch would send two astronauts to the moon to board the MOLAB.

One Saturn Moon Rocket Test Stand Going Up



SATURN TEST STAND—This is the first of three large test stands being built at NASA-Mississippi Test Operations for testing the first and second stages of the Saturn V moon rocket. This second (S-11) stage stand is now more than 50 feet high, and will ultimately be 162 feet. Leading to the stand, a canal is under construction (foreground) which will permit stages to be unloaded from barges and placed directly on the test stand.

Space News Of Five Years Ago

Nov. 2, 1959 — President Eisenhower announced his intention of transferring the Saturn project to NASA. The transfer became effective March 15, 1960.

Nov. 4, 1959—Little Joe 1-A was launched from Wallops Station to test the Mercury escape system under severe dynamic pressure. The launch vehicle functioned perfectly, but the escape rocket ignited several seconds too late. For this reason a repeat of the test was planned.

Nov. 5, 1959—The astronauts were fitted with pressure suits and indoctrinated as to use at the B. F. Goodrich Company.

Nov. 7, 1959—USAF Discoverer VII satellite placed into polar orbit, but capsule recovery not achieved.

Nov. 8, 1959—Between this date and Dec. 5, 1959, the tentative design and layout of the

Mercury Control Center to be used to monitor the orbiting flight of the Mercury spacecraft was completed. The control center would have trend charts to indicate the astronauts condition and world map displays to keep continuous track of the Mercury spacecraft.

Nov. 10, 1959—The AEC's SNAP 2 Experimental Reactor (SER) achieved initial design power of 50 thermal kilowatts in developmental tests at the Atomic, International, Santa Susana, Calif., test site. SER, the first reactor designed for use in space, was being designed for Air Force surveillance satellite systems.

Nov. 10, 1959—Space Task Group personnel visited McDonnell Aircraft in St. Louis, Mo., to monitor the molding of the first production-type couch for the Mercury spacecraft.

Space News ROUNDUP!

SECOND FRONT PAGE

Eight-Day Test Conducted—

Schweickart Has Birthday While Confined In Space Suit

The Gemini space suit can truly be called a "birthday suit" by Russell L. Schweickart, one of MSC's newest astronauts.

Schweickart's 29th birthday on Sunday, October 25, was spent within the confines of a Gemini space suit during an extended evaluation of biomedical equipment attached to the astronaut.

Around-the-clock for eight days that ended this past Monday, the Gemini suit was home for Schweickart for a series of tests, evaluations, and simulations to determine the compatibility of man and biomedical recording equipment over an extended period of time.

Doctors and engineers attached biosensors to the astronaut's body to record vital information from the test.

Schweickart suited up at the NASA Flight Research Center in Edwards, Calif. at 8 a.m., October 19, for a series of one-hour flights in a F-104B aircraft, to fly zero "g" and positive "g" maneuvers while biomedical data was recorded.

The holding van in which he suited up was used for flight preparation, sleeping, rest, eating and waste management. He consumed the special type Gemini food during the test.

A self-contained cooling unit was used by Schweickart during transportation to and from the aircraft, and a ventilator without cooling was used in the van.

The evening of October 21 he flew from Edwards to Ellington AFB, and slept in a hospital bed at the Manned Spacecraft Center.

Following his third night in the Gemini space suit, he began a 96 hour simulated flight in the MSC Gemini Mission Simulator, following as near as possible the duties of a normal Gemini mission.

Continuous monitoring of Schweickart and the suitability of his equipment was conducted by members of the MSC Crew Systems Division, and medical monitors, during the entire eight-day test. A voice tape recorder was used to record the comments of the astronaut during the test.

Early this past Monday Schweickart was flown to the Ames Research Center near San Francisco, Calif., for three modified Gemini reentry "g" profiles in the Ames centrifuge.

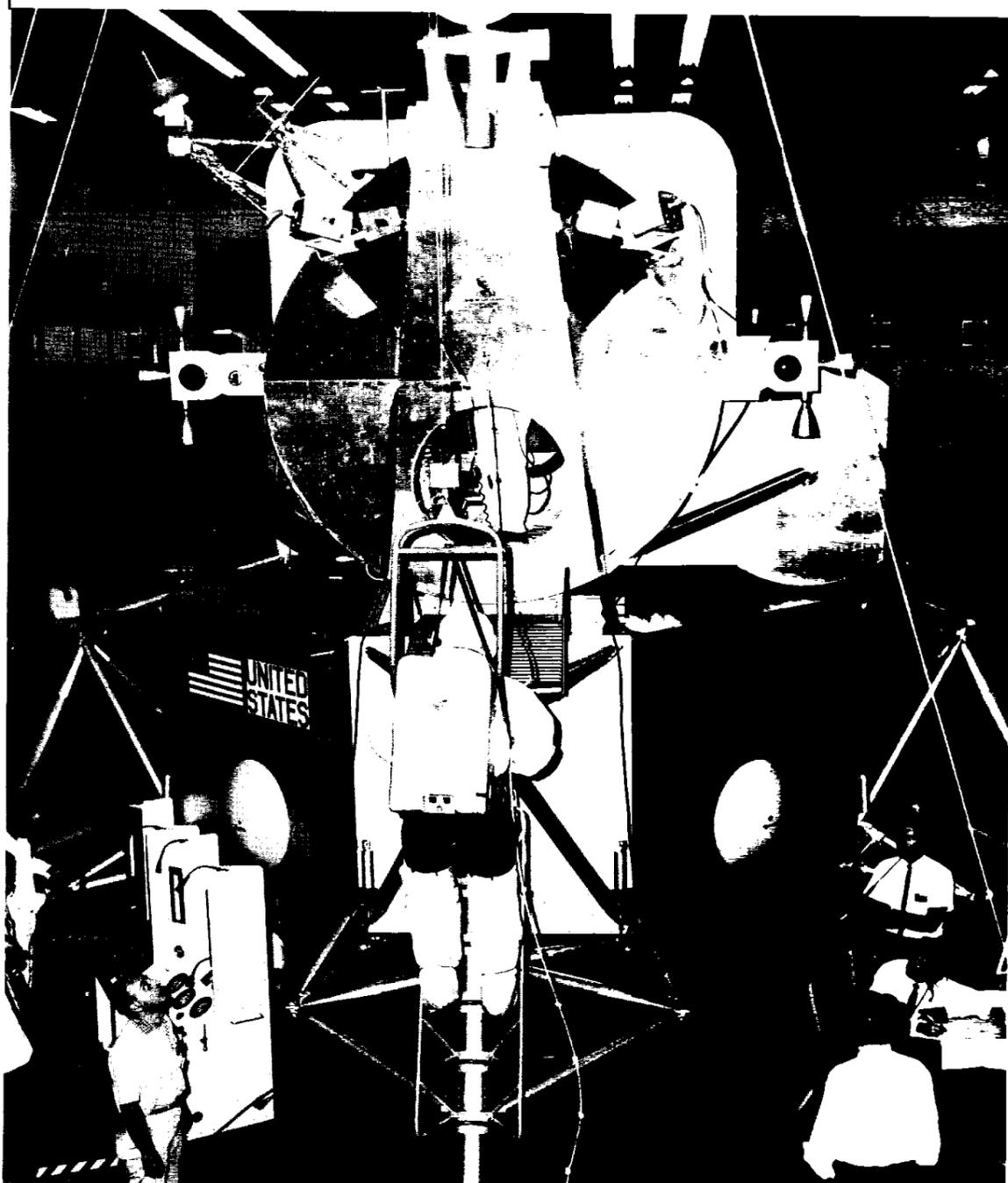
After the tests at Ames, Schweickart shed the Gemini suit, showered, shaved, and had a good night's sleep. He returned to MSC on Tuesday.

A final critique of the total evaluations is now being conducted by MSC engineers and medical staff.



BIRTHDAY PRESENT?—Astronaut Russell L. Schweickart, on his 29th birthday, receives a packet of dehydrated pea soup from Herbert Greider, test conductor responsible for a week-long test of biomedical equipment at the NASA Manned Spacecraft Center. Helping him celebrate his birthday are, from left, Greider; Howard Vick, a bioinstrumentation specialist; Tom Turner, a Gemini suit specialist, and Hal Parker of the Flight Simulation Branch. The cake was brought to Schweickart on Saturday night by his wife Clare. She also presented him with a toy electric razor that "sounds like dad's" but doesn't shave, and a bar of deodorant soap. (Schweickart was unable to bathe during the eight-day test.) Schweickart, who was testing freeze dehydrated space foods on Sunday, watched as members of the test team devoured his cake.

LEM Checkout Conducted By NASA At Grumman



LEM COCKPIT CHECKOUT—Shrouded in a thermal suit over his regular pressure suit, with operable back pack, Astronaut James Lovell prepares to check LEM cockpit for accessibility during the NASA Inspection and Review of the all metal mockup of the Lunar Excursion Module, at Grumman, Bethpage, N. Y., October 5-9. He is wearing the "Peter Pan" hoist rig that simulates the one-sixth gravity condition on the moon.

Lunar S-Band Antenna Demonstrated



S-BAND ANTENNA—Robert K. Smyth, LEM consulting pilot for Grumman Aircraft, demonstrates the S-band antenna for a press conference at Grumman, Bethpage, N. Y., October 8. The antenna can be stowed in a cylinder 10 inches by three feet. It unfurls like an umbrella and can be set up on the lunar surface to aid TV transmission to earth.